Use and shift toward weapon and combat systems to hybrid technology.

STUDENT NAME

STUDENT ID

MODULE CODE

LECTURER NAME

LETTER OF TRANSMITTAL

[Sender's Name]

[Sender's Address]

[Recipient's Name]

[Recipient's Title]

[Recipient's Organization]

[Recipient's Street Address]

[City, State, Zip Code]

Dear Sir/Madam;

The attached research proposal will find information regarding my selected topic: “Use and shift toward weapon and combat system to hybrid technology.”

My research proposal includes an introduction that will brief it on the topic overall. Followed by the Literature view, for which I have read four main thesis works that have been done in the past and a few for support of the idea that I'm pitching for the thesis.

Thank it for your supervision of this proposal and thesis. And if there are any remarks or corrections to be made, let me know, and I will try my best to reduce them and make them suitable for the further work of my thesis.

[Sincerely,]

[Signature]

[Sender's name]

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RESEARCH LINKS:

1. **https://ieeexplore.ieee.org/document/9299429**
2. https:// doi.org/10.1002/mop.31010
3. https://ieeexplore.ieee.org/document/8847793
4. https://zenodo.org/record/3381255#.YklA6DVRWMo

JUSTIFICATION:

The topic I have chosen for this is “use and shift toward weapon and combat system to hybrid technology.” It is because weapon and combat systems are being made for the most impact possible. For examples. It uses the advancement of long-range missile and vehicles that can upstand the significant effects of explosions and bullets. But these all require high power fuelled system to operate. For example, a fuel burned by the missile to fire is commonly kerosene, alcohol, hydrazine and its derivatives, and liquid hydrogen, which use the resources and affect the environment. As it is all known, there are limited resources. If it moves toward hybrid technology, it can reduce the use of resources and positively impact the environment.

ABSTRACT

This paper is for using hybrid technology for the weapon and combat systems used worldwide. As discussed in this paper, these technologies are hard to build, time-consuming, and costly. And there are problems with the heating issue in hybrid technology. Also, hybrid technology used commercially cannot be used in combat systems as their nature is different and won't survive a day. These technologies are being tested in the USA. But still, no superior result has been made because it is referred for armour, not alternatives to fuels in terms of combat and weapons.

INTRODUCTION

More than two decades of research have gone into lasers, robust microwave systems, and electric weapons like guns and grenades. Our rivals might have more troops, and they might have to deal with their logistics. These people might help us. Research and weapons have been done on how to use these weapons. Still, most military thinks they won't be used on ground combat platforms any time soon, even though they are essential in many critical technologies. (Dr. Marilyn M. Freeman, 2020) The lack of small pulsed power systems needed to run advanced ideas is a big problem in making them into weapons. In reality, the need for future combat systems to be more mobile, lighter, and smaller seems to be at odds with the market for current weapon systems in new vehicles. When pulsed power sources are used, a weapon that is already very big and heavy gets even more oversized and bulkier. (Electromechanics, 2000) This means that mechanical systems will be limited if these new systems are used to make future combat vehicles. Hybrid electric power systems that can meet all of the energy and power needs for better future combat vehicles are being developed by researchers as part of the DARPA Combat Hybrid Power Systems (CHPS) programme. This includes the power needed to run advanced weapons systems and other moving and communicating devices and the energy required to protect the vehicles from damage. Future combat vehicles might be able to use hybrid power, power management, and power-sharing to make them more powerful while still being lighter and smaller. The CHPS project will be the subject of this piece. It will also look at how the CHPS vehicle design process is essential in making future ground combat vehicles lighter, more mobile, lethal, survivable, and more durable. (SAIC Contractor Team, 2018) (Hakan, 2017)

Combatants Services in the United States are running out of combat vehicles that can still be used. Combatants Services are more concerned about how the U.S. military can adapt and be effective in an ever-changing world. The system it thinks it'll fight in the future makes us look for ways to improve the performance of our combat systems in terms of lethality, survivability, mobility and agility, strategic and tactical deployment, and sustainability. So, it doesn’t know how it'll fight next. (Team, 2000) Rapid deployment and military superiority with a small system of troops and vehicles require that combat systems be as effective as possible while minimizing their footprint. Use less fossil efficiency and spend less money on logistical support by making the subsystems and

overall system more efficient. The project should start in 2010. As a result, plans for 2020 and 2025 are said to be able to achieve their goals by combining current weapons and defence systems. To cut down on the number of vehicles on the battlefield, these proposals say that cars should be able to do a lot of different things at the same time (for example, direct fire support, air defence, and scout/RSTA on the same platform) (thereby reducing the logistics tail.) (R. Gallagher, 2020) (CARLOS A. REUSSER, 2020)

Contrary to what people think, traditional car designers don't have a lot of options to choose from. Its width and size are often cut down to deploy and carry a weapon system. In most future operations ideas, these two systems are critical. (America, 1999)

Literature review:

To get two-dimensional images, passive millimetre wave imaging (PMMW) looks for millimetre-wave bands of natural electromagnetic radiation. In addition to cosmic background radiation (CBR), the heat from the Big Bang3, the Earth also emits thermal radiation, which comes from objects or bodies with a temperature greater than 0 K8. (R., 2019) It doesn't surprise me that PMMW imaging helps find hidden weapons at airports and other checkpoints because of how important it is there. (Hu Z, 2010) (Clark Lovberg S, 2003)**.** Research done in the last few years has shown that PMMW imaging is an effective way to find and take high-quality pictures of hidden dangerous objects like weapons, knives, and explosives. (X, 2014) PMMW imaging technology is entirely safe for finding concealed weapons, even though active imaging systems that use millimetre wave frequencies might hurt nearby people. (Yeom S, 2011)For the PMMW receiver, the target only emits 9 out of 10 passive radiation that isn't ionizing to the receiver. It can also work in almost any bad weather, like snow, rain, and fog. Because the CBR's operating frequency is higher than standard radar frequencies, it can quickly pass through these barriers. To get scattering from almost any angle, the PMMW receiver can use its ambient CBR to reflect off of nearby objects. Active radar receivers can only do this from a single point.

They were more prevalent early in the twentieth century because of how quickly submarines and small cargo ships could be made at that time. Many naval propulsion systems used them in the future because they were expensive and unstable at the time, and they couldn't control speed and torque enough. People have made a lot of progress in power electronics devices and drive control techniques and the development of high-efficiency multiphase induction and synchronous motors (J. L. Kirtley, 2015). Depending on how much power is needed and how the propulsion system is set up, different electric propulsion systems have been made that use two-level and multilayer converters with series-connected and multilink electric machines. (D. L. Greene, 1982)Because propulsion needs so much force to move things, there have been a lot of different solutions used in this case. Warships, for example, have separate propulsion and armament systems. The propulsion system is not connected to the weapon system, so it doesn't work together. (Limpaecher, 2000) When new electric-powered ships are built, and energy distribution system is used to power pulse-power weapons and massive propulsion systems that can

move vast amounts of water. (2010)Compared to the past and the present ships, pulsed power weapons use a lot of energy to fire—this required extensive power systems and a better ability to move quickly. (Buckley, 2002)

People want to make all of the transportation systems that people use electric. When it comes to how quickly or slowly a ship changes, there are many things to think about; in this case, improving the efficiency of internal combustion engines will not be enough to meet the high standards set by the commercial sector for air pollution controls. As a result, electrifying onboard loads is a more integrated efficiency to design more efficient cars. Ships in the military are becoming more and more dependent on electricity to run their weapons and systems. The Navy has problems with efficiency and pollution, making it even more important to keep going this way (N. Doerry, 2015). It will be more efficient and well-equipped to fight (frigates and destroyers) if all of the world's powerful navies make changes to their fleets (frigates and destroyers). (U. Singh, 2013)The new ships must meet different standards than the ones that came before them, like being able to be used for both business and pleasure. They must also make more electricity (to power the new weapons systems and sensors (Stratton, 2020).

A lot of new weapon systems and sensors will need more power (Group, 2021). Onboard electrification of loads makes electric propulsion possible because of the vast amount of electricity this ship can make. The ship's range is expected to get bigger, which will allow it to do more missions. Another good thing about electric propulsion is that it doesn't make any noise, which is essential for naval boats. (al, 2021) So, the Integrated Power and Energy System (IPES) design can be used on surface combatant ships to allow for new weapons and sensors while also making the vessel more capable. A 100% electric system might be too heavy and bulky for front-line ships. To get the best of both worlds, it should use a hybrid system (electric propulsion for low speeds and mechanical propulsion for high rates) (electric propulsion for low speeds and mechanical propulsion for high speeds). A total of nine people were in the group at the same time. (A. Vicenzutti, 2019)

The U.S. Navy wants to build a Fleet that is more efficient to better fight wars. The limitations of x86 servers and the design of older hardware have led to many problems in getting hardware and software. Because of virtualization technology, the U.S. Navy can now combat system software on virtual computers, so the Navy's computer hardware is no longer a factor in how it does its jobs. Virtual computers that don't care about the

hardware were used to get more power for less money and better warfighting abilities. This post will look at how the AEGIS Combat System computer architecture came to be and why the Surface Navy needs to think about how it gets new skills. Another study shows that the Fleet is improving because of the AEGIS Virtual Twin programme, which talks about the best technological and testing benefits. As the last step, this study will look at how the Balanced Scorecard can be used to combine the benefits of virtualization and computing with a new model for future U.S. Navy Combat Systems. (Capt. A. M. Biehn a, 2019)

However, nuclear energy is expensive and can be trusted to be handed to everyone as nuclear energy can be easy access by nuclear weaponization. So, in this, nuclear energy can not be a success if it isn’t being supervised over its use and the quality assurance isn’t strict enough to support the program.

Limitation:

- A commercial hybrid system can't be used in combat.
- The hybrid combatant programme has been proven to be not a good thing to do.
- This will cost a lot of money.
- The Army must keep the parts of hybrid technology that make it work and last cold for it to work and last.
- It takes a cooling system to keep the parts of the car cool. This adds to the weight of the car.
- Troops in the military pay more attention to Armor than they have in the past.
- If it drives a car in specific ways, it may be able to save some money on efficiency.
- It can't just save money by using a hybrid electric car. The military can't save money just by using one. (Magazine, 2016)

Conclusion:

It is essential for weaponry and combatant to swift towards hybrid technology for this discussion. But on the other hand, it is not near for the technology to swiftly directly to hybrid as the project for this will be costly and time-consuming. Combats cannot afford, and commercially built hybrid technology cannot be used for warfare or military use.

Recommendation:

The limitation is mostly on cost and heating or uses for a long time with no heating issue or anything that can be better or equivalent to fuel power systems used by the military. And research on reduction of cost and overcoming heating issues will give the military an upper hand and a privilege to use the hybrid or e-power system and equipment for their use.

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Activities
Month 1
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Month 6
Conduct Background Reading
Prepare Proposal / Initial Meetings
Conduct Literature Review
Specify Research Planning Methods
Perform Data Collection & Analysis
Submit Some Draft Work
Discuss Conclusions
Conduct Final Meeting
Submit Final Draft